VELOCITY PROFILING FIELD REPORT
for
SAN JACINTO SUPERFUND SITE
HOUSTON, TEXAS

Prepared by:

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Prepared for the:
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY RCRA
DIVISION REGION 6

May 2015

Abbreviations and Acronyms

ADCP	acoustic doppler current profiler
EPA	U.S. Environmental Protection Agency
HASP	health and safety plan
QAP	quality assurance plan
RPM	remedial project manager
Site	San Jacinto Superfund Site
USGS-TL	U.S. Geological Survey technical liaison
USGS	U.S. Geological Survey- water mission

1.0 Introduction

The San Jacinto Superfund Site (Site) is located north of the I-10 bridge over the San Jacinto River just east of the City of Houston (figure 1). The site consists of impoundments (approximately 14 acres) that were built in the mid-1960's. These impoundments were used to store paper mill wastes. The wastes deposited in the impoundments were contaminated with polychlorinated dibenzo-p-dioxins, polychlorinated furans, and some metals. The impoundments are partially submerged due to physical changes to the area and pose a potential exposure pathway to the San Jacinto River. In 2010, a time critical removal action was put in place where stabilization of the pits took place to prevent direct contact to humans and the environment. After the removal action a surface water hydrological model was developed by a contractor to be used as a tool to help develop a remedy for the site. The U.S. Environmental Protection Agency (EPA) is evaluating the surface water model through an independent review by the U.S. Army Corps of Engineers.

The EPA and the U.S. Geological Survey- Water Missions (USGS) have a partnership through an interagency agreement. The USGS provides a USGS Technical Liaison (USGS-TL) who is assigned to the Superfund Division of EPA Region 6 in Dallas, Texas. EPA Remedial Project Managers (RPMs) use the USGS-TL as a resource to help review documents, offer technical advice, attend site specific meetings, and to be a facilitator to find USGS personnel with specialized technical abilities to support EPA's missions. The EPA RPM for this Site has requested technical assistance from the USGS through the USGS-TL. The EPA independent reviewer of the model is in need of some velocity profiles at the Site. USGS has the expertise and equipment to collect the data that is needed for the independent reviewers. EPA provided the USGS with a work order that detailed the work that the USGS will conduct at the site. The USGS submitted a work plan (USGS, 2015) to the EPA that describes all the details of collecting the data that was requested by the EPA work order.

Figure 1: Location of San Jacinto Superfund Site, Houston, Texas.

2.0 Purpose of Report

The purpose of the report is to describe the work conducted at the site and submit the data collected during the field event to the EPA. The data collected at the site will be used by the U.S. Army Corp of Engineers in review of a site model prepared by a private consulting company.

3.0 Tasks

Task 1: Work Plan, Quality Assurance Plan, and Site Health and Safety Plan Preparation: A work plan was prepared and included a site description, tasks, cross section locations, data collection methods, and reporting requirements. In addition, a quality assurance plan (QAP) and a site health and safety plan (HASP) was provided.

Task 2: Data collection: USGS staff from the USGS Woodlands, Texas office collected discharge and velocity profile data using an acoustic doppler current profiler (ADCP) at three transects during tidal conditions. Figure 2 shows transects selected for the site.

Task 3: Post processing: USGS staff has post process the data using Velocity Mapping Toolbox (VMT) for visualizing velocity data.

Task 4: Field report: The USGS has provided a field report (this document) to EPA which describes the work conducted and include the data collected at the Site.

Task 5: Discussion: USGS staff will be available for technical questions in regards to data collection and results. The technical support may be provided in writing, conference calls, or face to face meetings.

3.0 Site Activities

The USGS staff (Jody Avant and Thomas Pistillo) arrived on the site on the morning of February 19th, 2015. Gary Miller of the EPA was onsite to oversee the data collection activity. The USGS team collected velocity profiles along three transects using an ADCP (Appendix A). USGS collected the data following methods described in Mueller, D.S. and others, 2013 http://pubs.usgs.gov/tm/3a22/pdf/tm3a22.pdf. For each transect, two separate channel passes were completed and the velocity data reported is the average of the two runs.

USGS staff collected a total of six transects on February 19th, 2015 using a Teledyne RDI River Ray ADCP during an outgoing tide. Five of the six transects (labeled as .003, .004, .005, .006, and .007 in TRDI WinRiver II software) were found usable for importing data into the VMT software for further processing of velocity data. Transects .000, .001, .002 and .003 were made just upstream of the I-10 Bridge (lower transect). Transect .000 was used to help calculate discharge when combined with transect .003, but does not contain any GPS data needed to plot velocity data in VMT since the GPS unit failed to collect data during this run. Transects .001 and .002 were not used for analyses since the data wasn't usable. Transects .004 and .005 (middle transect) were located upstream from transect 3 Transects .006 and .007 (upper transect) were located upstream from transects 4 and. Transect .004 and .005 were combined as one data set for most applications in the VMT software, as well as transects .006 and .007.

4.0 Post Processing

Jason Pollender and Ryan Jackson of the USGS processed the data collected from the three locations using the velocity mapping toolbox (VMT). Information on VMT is located at http://hydroacoustics.usgs.gov/movingboat/VMT/VMT.shtml. The data can be located at the following ftp site.

Appendix A visually depicts depth averaged velocity direction and velocity magnitude along with location for all useful data collected. Averaging and smoothing of data was used in the processing of all data in VMT.

Appendixes B, C, D are individual cross sections at each location. Color intensity indicates downstream flow velocity and secondary flow vectors are depicted with arrows. For reference, the left side of the diagram indicates the left edge of the water (looking downstream).

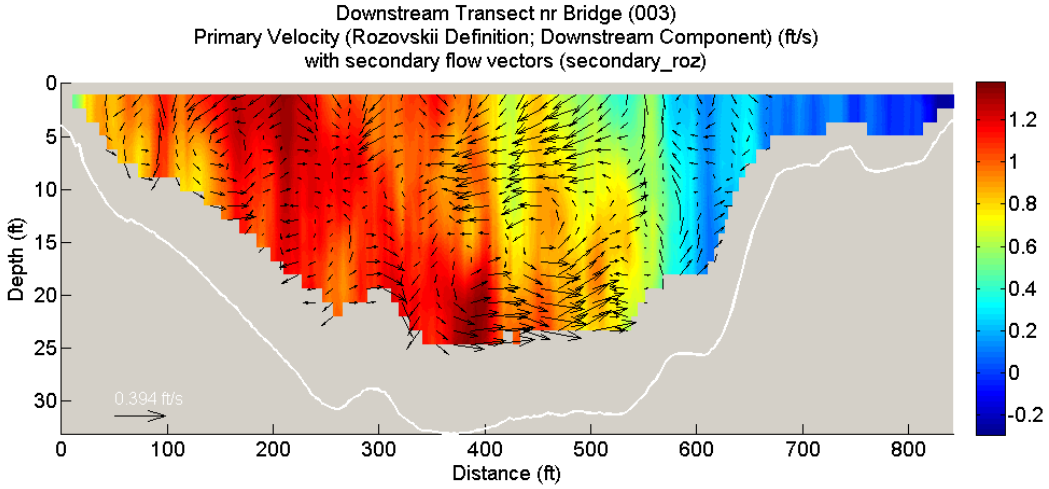
In addition to the appendices, available on the FTP site (ftp://ftpext.usgs.gov/pub/cr/tx/fort.worth/) is exported velocity data from VMT software in Excel, figures, discharge figures, and additional processing notes (folder called Data for EPA).

5.0 References

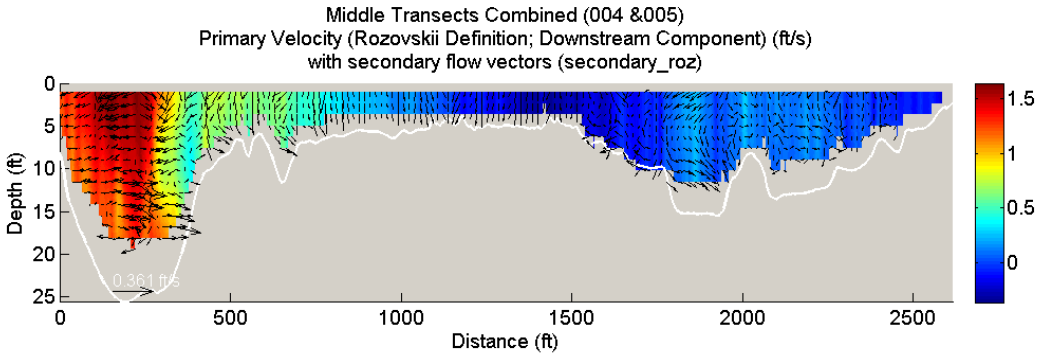
U.S. Geological Survey, 2015, San Jacinto Velocity Profiling Work Plan Houston, Texas, prepared for the U.S. Environmental Protection Agency Region 6 Superfund Division, Dallas, Texas, 34 pp.

Appendix A: Depth-Average Velocities Transects 3 thru 7

Appendix B: Primary Velocity at Transect 3 (bridge section above I-10)



Appendix C: Primary Velocity at Transect 4 and 5 (middle transect)



Appendix D: Primary Velocity at Transect 6 and 7 (upper transects)